THE ASTROGRAPHIC CATALOGUE.—Part i., vol. viii., of the Catania *Catalogo Astrofotografico* gives 7923 positions of stars shown on fifteen plates covering the area oh. to 3h. R.A., and +53° to 55° declination; excluding repetitions the number of separate stars dealt with is 6916.

In vol. i. of the Perth section of the catalogues, Mr. W. E. Cooke gives the rectangular coordinates and magnitudes of 5646 star images between R.A. oh. to 6h., on plates having their centres at declination −32°, and in vol. v. of the Perth meridian observations, he gives a catalogue of 2043 stars between 35° and 37° south declination for the equinox of 1900. The stars of this latter catalogue are those selected as reference points for the astrographic catalogue, and were observed with the Perth 6-inch transit circle during 1910; they are distributed approximately at the rate of three per square degree.

POSITION OF THE RED SPOT ON JUPITER.—In a brief note communicated to No. 4583 of the *Astronomische Nachrichten*, the Rev. T. E. R. Phillips announces that recent observations made by him at Ashtead show that the red spot on Jupiter has continued to drift rapidly in longitude. Whereas at the end of June, 1911, its longitude (ω_2) was 325°±, in April last it was only 305°−306°.

THE DISEASES DUE TO FILARIA BANCROFTI.[1]

THE subject-matter of the work referred to below may be considered under three headings: (1) The transmission of filaria by mosquitoes. In Fiji the carrier is mainly *Stegomyia pseudoscutellaris*. The developmental stages are carefully described, but some of the illustrative plates are not very good. The author's experiment tending to show that the filarial larvæ find their own way in through the skin is a most interesting one. (2) The clinico-pathological facts, though scattered about the book and not blended into one harmonious picture, form some of the most valuable information supplied. No explanation is suggested for the absence of chyluria, generally taken as a typical filarial disease, nor is any light shed on the pathology of elephantiasis, but the concrete facts as to where really filariæ do occur, and what changes they produce, are a welcome addition to our knowledge. (3) The connection between filaria and the so-called filarial diseases is considered statistically. We have been at some pains to unravel the author's data from a variety of tables most confusingly presented, in which percentages are erroneously calculated and totals wrongly added up. They may be summarised in the following statements:—

(1) The prevalence of filarial diseases is proportional to the prevalence of filariæ larvæ (microfilariæ) in the blood:—

	Bau Per cent.	Oneata Per cent.	Lakemba Per cent.	Loma-loma Per cent.
Microfilarial rate	12·5	25·4	31·5	32·88
Filarial disease rate ...	28·9	39·4	58·0	34·2

but, as will be observed, the relationship is not very close.

(2) If we consider *only* those showing microfilariæ in the blood, the *majority* shows signs of disease, viz. 153 with signs, 104 without. Total, 257.

(3) If we consider those *not* showing microfilariæ in the blood, they also show signs of disease, but now in a *minority*. With signs 263, without 409. Total, 672.

(4) Finally, if we consider *only* those showing signs of disease, the *minority* show microfilariæ in the blood. With microfilariæ 153, without 263. Total, 416.

The explanation of this latter fact, which might at first sight appear inconsistent with (2), is presumably that the worms which occur in enlarged glands, &c., get eventually destroyed in these sites, so that the sign of the disease which they have produced remains after the cause—the adult worm—has disappeared. We must also suppose that microfilariæ do not live indefinitely in the blood, otherwise this relationship could not occur, but if they disappear there probably will always be a majority showing signs of disease, but no microfilariæ in the blood.

As regards elephantiasis, its filarial nature is almost entirely based on epidemiological and statistical evidence, for the arguments that apply to the "signs of disease" as a whole apply to it as one of those signs. It should be noted, however, that in thirteen out of twenty-seven cases there were no visibly enlarged glands to account for a hypothetical obstruction, which is commonly presumed to be the cause of the phenomenon.

The arrangement of the book is not all that could be desired. The photographs with a different numbering from the plates are sprinkled among the latter in a way that makes them very difficult to trace, except by reference to the list of illustrations. The subdivision of the paragraphs, *e.g.* 111 (2) C is unnecessarily complicated, and several of those alluded to we have been unable to find. The defects in the statistical portion we have already mentioned. While it is clear that the book represents the results of much work, it also shows that very much more remains to be done.

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[1] "Filariasis and Elephantiasis in Fiji." Being a Report to the London School of Tropical Medicine. By P. H. Bahr. Pp. viii+192. (London: Witherby and Co., 1912.) Price 6s. net.

THE ERUPTIONS OF THE ASAMA-YAMA (JAPAN) IN 1909–11.[1]

THE Asama-yama, situated in the central part of the main island of Japan, may be regarded as one of the most active of Japanese volcanoes. Its highest point is 8130 ft. above sea-level, and about 4200 ft. above the surrounding land. The present crater is about 400 ft. in depth and a quarter of a mile in diameter. The earliest recorded eruption took place in A.D. 685, the greatest in 1783. Since this year the volcano has remained comparatively quiet until within the last few years. Since December, 1909, the explosions have been very frequent, more than sixty having occurred within the next two years. The floor of the crater has also risen considerably during the last twenty years, and everything, in the opinion of Prof. Omori, who is closely studying the phenomena, points to the gradual approach of another epoch of great volcanic activity, possibly after a lapse of about twenty years.

At the request of the Japanese Government, the seismological examination of the mountain was undertaken by Prof. Omori, who also made three ascents of the mountain. Temporary seismographical observations were made at Yuno-taira and Ashino-taira, both places being situated on the south-western slope at heights of 4520 and 6300 ft. above sea-level, and in August, 1911, a seismological station of a more permanent character was established near Yuno-taira. The value of these observations consists in the fact that the tremors recorded belong to two distinct types. In one the shocks consisted of minute quick tremors only; in the other they began with slow movements, interspersed after a few seconds with quick vibrations. The earthquakes of the first type were accompanied by no outburst

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[1] Abstract of a paper by Prof. F. Omori in the Bulletin of the Imperial Earthquake Investigation Committee, ol. vi., 1912. pp. 1–147

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of the Asama-yama; those of the second type were invariably the result of explosions of the volcano.

Some of the most interesting of Prof. Omori's results relate to the areas over which the volcanic detonations were heard and the ashes deposited. The detonations were produced entirely by air-waves, and were often heard as far as 180 miles from the volcano, although the shaking of the ground was insensible in its immediate neighbourhood. As a general rule, the sound-area diverged from the Asama-yama as apex towards the east or south-east, the sound being unheard at a short distance to the west of the volcano. In some cases the direction of greatest extent of the sound-area did not differ much from that of the prevailing surface-winds; in other cases it differed widely, or was even contrary. In two explosions the sound-area consisted of two detached portions, one including the Asama-yama, the other some fifty or sixty miles farther to the west. In one explosion only, the sound-area diverged from the vicinity of the mountain towards the north-east. But in neither of the last two types is there any relation between the distortion of the sound-area and the direction of the surface-wind.

The areas of ash-precipitation are generally narrow and triangular, the directions varying, with one exception to the west, from east-north-east to east-south-east, being usually in the latter direction. These areas are roughly symmetrical with respect to the sound-areas. The velocities with which the ashes were carried varied from thirty-eight to seventy-eight miles an hour, these being much greater than the velocities of the surface-winds at the time.

Prof. Omori concludes that the principal direction of extension of the sound-area is the same as that of the wind prevailing in the upper strata of the air, probably at a height of about five or six miles, this being the height generally attained by the columns of smoke which rose from the volcano.

C. DAVISON.

THE FRESH-WATER FAUNA OF CENTRAL EUROPE.[1]

PROF. ZSCHOKKE'S (1) monograph, which is provided with three excellent maps, gives a detailed account of the present state of our knowledge of the composition, distribution, and biology of the deep-water fauna of the lakes of central Europe. For purposes of description the lakes are divided into sub-alpine and high-alpine series. Lake Lucerne is taken as a prototype of the former, and an account is given of its various basins and their deep-water organisms. One hundred and ninety-eight samples of the bottom, including some from the maximum depth (214 metres), have been taken, and have been examined by various workers. The bottom of this lake (and of other sub-alpine lakes) is covered with fine mud, in which vegetable remains—fibres, leaves, pollen of conifers, &c.—are everywhere present, and in some places abundant. Among this material large numbers of Oligochæta, Nematoda, and insect-larvæ thrive.

The author gives a list of 141 species of deep-water animals—Protozoa, Cœlentera, Turbellaria, Nematoda, Rotifera, Oligochæta, Hirudinea, Polyzoa, Crustacea, Hydracarina, Insecta, and Mollusca—occurring in Lake Lucerne, the range of depth and locality of each species being indicated. He then proceeds to the systematic description of the deep-water fauna of the sub-alpine lakes in general, an account of each order or sub-order prefacing the remarks on the constituent species. The notes on each species indicate in which lakes it has been found, the range of depth at which it occurs, and there are in many cases observations on the biology, or on any special features presented by the distribution, including comments on the range of the species in other countries.

There is an interesting discussion on the "Kümmerformen" of the deep-water Mollusca, which are distinguished from their shore-dwelling relatives by their small size, fragile shells, and peculiar form. The author points out that, for instance, in the case of specimens of Pisidium living in deep water, the stillness of the water makes the secure closing of the shell and well-developed hinge-teeth superfluous, the poverty of food accounts for the small size and the frailty of the shells, the equalisation of the seasons and the vanishing of differences of temperature cause the annual rings to become indistinct or to vanish altogether. He maintains that the deep-water Lamellibranchs are the remnants of a glacial fauna, which, in its present refuges, has retained the old glacial "Kümmerform." These forms are, therefore, not secondary, as they have been regarded, but ancestral.

The deep-water fauna in general, especially the Rhizopoda, Turbellaria, Entomostraca, and Hydracarina, is shown to be a mixture of elements of two chief kinds. Some of the organisms represented are to be found within wide limits of temperature (eurythermic), and are truly cosmopolitan; others are restricted to waters of low temperature (stenothermic), and are to be regarded as the remains of a glacial or post-glacial fauna. The expectation of some earlier writers, that the investigation of the deep-water fauna would reveal a centre of origin of new species, is not realised.

(2) This memoir forms the second part of the account of the natural history of this "Grossteich," a small lake about 3 and 1·6 km. in extreme length and width respectively. The object of the researches, begun in 1899, and carried on since 1908 by the aid of a laboratory built near the lake, has been the complete investigation of the general biological phenomena of a single water-basin; in fact, an intensive study of these phenomena, in a small, suitable, and easily accessible lake. The investigation has been divided into sections, dealing respectively with the geological, hydrographical, chemical, botanical, and zoological aspects, each in charge of a separate worker.

The present volume contains a record of the faunistic and biological observations on the littoral Cladocera, prefaced by a description of the lake, of the surrounding hilly country, and of the sources of water supply. The qualitative and quantitative apparatus used in collecting the aquatic organisms of the lake is described; this included a "rotator," practically a short half-cylinder, which by a rapid turn can be made to take, by a single scoop, a sample of the surface water down to a depth of about 50 cm. A list of fifty-nine species of littoral Cladocera from this lake is given. Doubtless the great variety of the shore conditions accounts for the richness of the fauna, but the large number of species recorded is due to the numerous collections made and to the careful study devoted to them. The author remarks that probably a few (about nine) species may be added to his list by subsequent researches, as several well-known Cladocera have not yet been taken in the lake, *e.g.* the genus Bythotrephes, and *Bosmina longispina* and its relatives.

For faunistic purposes the lake is divided into eight

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[1] (1) "Die Tiefseefauna der Seen Mitteleuropas." Eine geographisch-faunistische Studie. By Prof. F. Zschokke. Pp. vi+246+3 maps. (Leipzig: Dr. Werner Klinkhardt, 1911.)

(2) "Der Grossteich bei Hirschberg in Nordböhmen." Naturwissenschaftliche Untersuchungen veranlasst und herausgegeben von der Gesellschaft zur Förderung deutscher Wissenschaft, Kunst und Literatur in Böhmen. II. "Die Biologie der litoralen Cladoceren." Untersuchungen über die Fauna des Hirschberger Grossteiches. 1 Teil. By Dr. V. H. Langhans. Pp. viii+101+62 figs+30 plates. (Leipzig: as above.)

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